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ABSTRACTS

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A-10

METASTABLE STATES RELAXATION IN THE ACTIVE MEDIUM OF METAL VAPOR LASERS

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One of the main reasons for limiting the frequency-energy characteristics (FEC) of radiation from lasers based on self limited transitions of metal atoms (LSTM) is the high values of the prepulse electron concentration and metastable states population of metal atoms in the active medium. Which of these parameters determines the limitation of the frequency energy characteristics of laser radiation has been the subject of a long discussion, although it is well known that metastable states are very effectively quenched in collisions with electrons.

The report presents the results of the study of the electrophysical process in the discharge circuit of the LSTM. It is shown that the slow metastable states relaxation in the interpulse period is due to the dissipation of the energy stored in the reactive components of the laser discharge circuit. Technical solutions to neutralize this process are discussed.

A-11

IMPROVING THE EFFICIENCY OF A DISCHARGE ArF LASER

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This paper presents the results of numerical and experimental studies of an electric discharge ArF laser, as well as the formation of narrow band radiation in it. The studies were carried out on an EL series electric discharge ArF laser developed at the ISE SB RAS, Tomsk [1]. The laser had a radiation energy of 250 mJ at a pulse repetition rate of 100 Hz.

For numerical studies, a model of an electric discharge ArF laser was developed. The pump discharge and the creation of an active medium were simulated in the 0D approximation. An agreement was obtained within 10% with the experimental results both on the oscillograms of the current and voltage across the discharge capacitor and on the laser radiation energy.

A dispersive resonator and single pass amplification of radiation in the active medium of the same laser were used to generate radiation with a narrow lasing spectral line.

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1. *Bychkov Yu.I., Losev V.F., Panchenko Yu.N., Yastremsky A.G., and Yampolskaya S.A.* Research of short pulse discharge XeCl laser // Proc. SPIE. V. 5777 (PART II), No. 103. 2005. P. 558–561.

A-12

PENNING LASER ON NEUTRAL NEON ATOMS' TRANSITIONS WITH LASING ON $\lambda = 585.3$ nm

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For the first time, the creation of an inductive Penning plasma laser on neon with lasing wavelength of 585.3 nm is reported. The excitation system included a pulse voltage generator and a discharge circuit, consisting of storage and peaking capacities, a TPI1-10k/50 thyratron as a high